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IS 10026-3-6 (1983): Insulating Varnishes Containing Solvents, Part 3: Specifications for Individual Materials, Section 6: Baking Varnishes with Temperature Index 155 [ETD 2: Solid Electrical Insulating Materials and Insulation Systems]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 10026 (Part 3/Sec 6) - 1983
(Superseding IS : 350 - 1968)
(Reaffirmed 1996)

Indian Standard
SPECIFICATION FOR
INSULATING VARNISHES CONTAINING
SOLVENTS

PART 3 SPECIFICATIONS FOR INDIVIDUAL
MATERIALS

Section 6 Baking Varnishes with Temperature
Index 155

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NEW DELHI 110002

IS : 10026 (Part 3, Sec 6) - 1983
(Superseding IS : 350-1968)

Indian Standard

**SPECIFICATION FOR
INSULATING VARNISHES CONTAINING
SOLVENTS**

**PART 3 SPECIFICATIONS FOR INDIVIDUAL
MATERIALS**

**Section 6 Baking Varnishes with Temperature
Index 155**

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IS : 10026 (Part 3/Sec 6) - 1983

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Indian Standard

**SPECIFICATION FOR
INSULATING VARNISHES CONTAINING
SOLVENTS**

**PART 3 SPECIFICATIONS FOR INDIVIDUAL
MATERIALS**

**Section 6 Baking Varnishes with Temperature
Index 155**

0. FOREWORD

0.1 This Indian Standard (Part 3/Sec 6) was adopted by the Indian Standards Institution on 24 March 1983, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard deals with insulating varnishes containing solvents. It consists of the following three parts:

- Part 1 Definitions and general requirements,
- Part 2 Methods of tests, and
- Part 3 Specifications for individual materials.

0.3 This standard covers the requirements for baking varnishes with temperature index 155.

0.4 This standard should be read in conjunction with IS : 10026 (Part 1)-1981* and IS : 10026 (Part 2)-1982*.

0.5 This standard specifies optional requirements for density, flash point, dilution ability and reaction of varnish with copper, which shall be carried out if agreed to between the purchaser and the supplier and shall be within the limits when compared with declared values applying the tolerances given in Table 1.

*Specification for insulating varnishes containing solvents:

Part 1 Definitions and general requirements.
Part 2 Methods of tests.

IS : 10026 (Part 3/Sec 6) - 1983

0.6 This standard supersedes IS : 350-1968*.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 3/Sec 6) covers the requirements for both impregnating and finishing insulating varnishes containing solvents, curing of which requires the application of heat and which are of temperature index 155.

1.2 Impregnating varnishes are classified in two types, namely:

- a) flexible, and
- b) hard.

2. GENERAL REQUIREMENTS

2.1 All materials in a consignment shall comply with the requirements given in IS : 10026 (Part 1)-1981‡, for colour, condition of supply, and shelf life.

3. PERFORMANCE REQUIREMENTS

3.1 When tested according to the relevant methods described in IS : 10026 (Part 2)-1982‡, the material shall conform to the requirements given in Table 1.

*Specification for organic baking, impregnating, insulating varnishes for electrical purposes (*first revision*).

†Rules for rounding off numerical values (*revised*).

‡Specification for insulating varnishes containing solvents:

Part 1 Definitions and general requirements.

Part 2 Methods of tests.

AMENDMENT NO. 1 MARCH 1986

TO

IS:10026 (Part 3/Sec 6)-1983 SPECIFICATION FOR
INSULATING VARNISHES CONTAINING SOLVENTS

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 6 Baking Varnishes with
Temperature Index 155

[Page 5, Table 1, Sl No. (iii)] - Substitute the following for the existing matter under respective columns:

SL NO. (1)	PROPERTY (2)	TEST METHOD CLAUSE (3)	REQUIREMENT (4)	REMARKS (5)
iii)	Non-volatile matter†	5 of IS:10026 (Part 2)- 1982‡	±2 percent of the nominal value	Nominal value to be agreed between the purchaser and the supplier and shall not be below 40 percent

(ETDC 63)

Reprography Unit, ISI, New Delhi, India

TABLE 1 SCHEDULE OF CHARACTERISTICS

(Clauses 0 4 and 3 1)

SL No.	PROPERTY	TEST METHOD CLAUSE	REQUIREMENT	REMARKS
(1)	(2)	(3)	(4)	(5)
i)	Density*	3 of IS : 10026 (Part 2) - 1982†	± 0.05 of the nominal value	Nominal value to be agreed upon between the purchaser and the supplier
ii)	Viscosity†	4 of IS : 10026 (Part 2) - 1982†	± 15 percent of the nominal value	Nominal value to be agreed upon between the purchaser and the supplier
iii)	Non-volatile matter†	5 of IS : 10026 (Part 2) - 1982†	± 2 percent of the nominal value	Nominal value to be agreed upon between the purchaser and the supplier
iv)	Drying in thin film	6 of IS : 10026 (Part 2) - 1982†	Non-tacky in not more than 4 hours	See Note 1
v)	Flash point, <i>Min</i> *	7 of IS : 10026 (Part 2) - 1982†	23°C	—
vi)	Dilution ability or compatibility, percent, <i>Min</i> *	8 of IS : 10026 (Part 2) - 1982†	100	—
vii)	Ability to cure in considerable thickness†	9 of IS : 10026 (Part 2) - 1982†	Not worse than S 1, U.1, and I 4.1 uniform	See Note 1
viii)	Check for resoftening†	10 of IS : 10026 (Part 2) - 1982†	Not worse than W.2	—
ix)	Reaction of varnish with copper*	11 of IS : 10026 (Part 2) - 1982†	The copper shall not change colour	—

(Continued)

TABLE 1 SCHEDULE OF CHARACTERISTICS — *Contd*

SL No.	PROPERTY	TEST METHOD CLAUSE	REQUIREMENT	REMARKS
(1)	(2)	(3)	(4)	(5)
x)	Stability of varnish in an open vessel†	12 of IS : 10026 (Part 2) - 1982‡	Change in viscosity not more than 3 times the original value. No skin formation, precipitation or gelled lumps	—
xi)	Effect of varnish on enamelled wire†	13 of IS : 10026 (Part 2) - 1982‡	Pencil hardness not softer than H	Applicable for impregnating varnishes only
xii)	Flexibility test:	14 of IS : 10026 (Part 2) - 1982‡		
	a) Mandrel test†		No cracking of varnish film, detectable by normal vision	Applicable for flexible varnishes only
	b) Adhesive strength, N/mm ² , Min		4 5	See Note 1
xiii)	Resistance to transformer oil:	15 of IS : 10026 (Part 2) - 1982‡		
	a) Visual examination		No evidence of attack	—
	b) Total acidity, mg KOH/g, Max		0 40	—
	c) Sludge value, percent by mass, Max		0 10	—
xiv)	Effect of heat ageing on flexibility	16 of IS : 10026 (Part 2) - 1982‡	No visible damage or detachment of the film on convex side, on bending over a mandrel of diameter 4.75 mm	For flexible varnishes only

xv)	Electric strength, kV/mm, <i>Min</i>	17 of IS : 10026 (Part 2) - 1982†	50	See Note 1
			a) In air, at room temperature†	—
			b) In air, at 155°C	—
			c) After immersion in water†	—
xvi)	Resistance to tracking, <i>Min</i>	18 of IS : 10026 (Part 2) - 1982†	50 drops	The type of chemical and its concentration to be agreed upon between the purchaser and the supplier
xvii)	Volume resistivity, Ohm. cm, <i>Min</i> †:	19 of IS : 10026 (Part 2) - 1982†		See Note 1
			1 × 10 ¹³	
			1 × 10 ⁸	
			1 × 10 ¹³	
xviii)	Bond strength coefficient†	20 of IS : 10026 (Part 2) - 1982†	1.3 <i>Max</i>	For flexible insulating varnishes only
			1.3 <i>Min</i>	For hard insulating varnishes only
xix)	Dissipation factor and permittivity	21 of IS : 10026 (Part 2) - 1982†	Under consideration	—

(Continued)

TABLE 1 SCHEDULE OF CHARACTERISTICS — *Contd.*

Sl. No.	PROPERTY	TEST METHOD CLAUSE	REQUIREMENTS	REMARKS
(1)	(2)	(3)	(4)	(5)
xx)	Thermal endurance	22 of IS : 10026 (Part 2) - 1982†	Temperature index not less than 155	a) Reduction in electric strength to 12 kV/mm b) Loss of mass up to 30 percent c) Bond strength (by helical coil method) up to 50 percent of initial value
xxi)	Resistance to mould growth	APPENDIX G of IS : 6127-1971§	To pass the test	See Note 3

NOTE 1 — Temperature and time for curing of each coat is to be recommended by the supplier.

NOTE 2 — Applicable for finishing varnishes specially designed for resistance to tracking.

NOTE 3 — Applicable for finishing varnishes specially designed for resistance to mould growth.

*Optional requirements, to be carried out if agreed to between the purchaser and the supplier

†Shall be carried out as routine test

‡Specification for insulating varnishes containing solvents : Part 2 Methods of tests.

§Specification for varnish, spar and fungicidal

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